WM-F2078

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model

Model Name Using Similar Mechanism	WM-AF23/BF23
Tape Transport Mechanism Type	MF-WMF2078-19

SPECIFICATIONS

Radio section

Frequency range
FM: 87.5 – 108 MHz
AM: **US, Canadian, E model:** 530 – 1,710 kHz (10 kHz step)
AEP, UK model: 531 – 1,602 kHz (9 kHz step)

Antennas
FM: Headphone cord antenna
AM: Built-in ferrite bar antenna

Tape player section

Frequency response (Dolby NR off)
30 – 15,000 Hz

Power output
10 mW + 10 mW, 16 ohms at DC operation

Output
Headphones (stereo minijack): load impedance 8 – 300 ohms

Power requirements
3 V DC, two R6 (size AA) batteries
DC IN 3 V jack accepts:
Optional Sony EBP-500B battery case for use with R20 (size D) batteries
Optional Sony AC-D2M AC power adaptor
US, Canadian model: 120 V AC, 60 Hz
UK model: 240 V AC, 50 Hz
AEP model: 220 V AC, 50 Hz
E model: 120 V AC, 60 Hz or 220 V AC, 50 Hz
Optional Sony DCC-70 car battery cord for use with 12 V car battery

Battery life
Approx. 6 hours of tape playback and approx. 16 hours of FM reception, using Sony alkaline batteries AM3 (N)

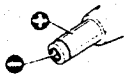
Dimensions
Approx. 97 × 119 × 43 mm (w/h/d) not incl. projecting parts and controls

Weight
Approx. 330 g, incl. batteries

Accessories supplied
Belt clip (1)
Canadian, European and UK model: Stereo headphones (open-air type, 1)
Other model: Stereo earphones (open-air type, 1)

Design and specifications subject to change without notice.

Note: If an AC power adaptor or a car battery cord not manufactured by Sony is used, a fuse must be installed in the AC power adaptor or the car battery cord and the polarity of the plug must be as illustrated.



MICROFILM

RADIO CASSETTE PLAYER

SONY®

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Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270℃ during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

WARNING !!

ADVARSEL!
Lithiumbatteri – Eksplosionsfare
Udskiftning må kun foretages
af en sagkyndig, og som
beskrevet i servicemanualen.

LITHIUM BATTERY

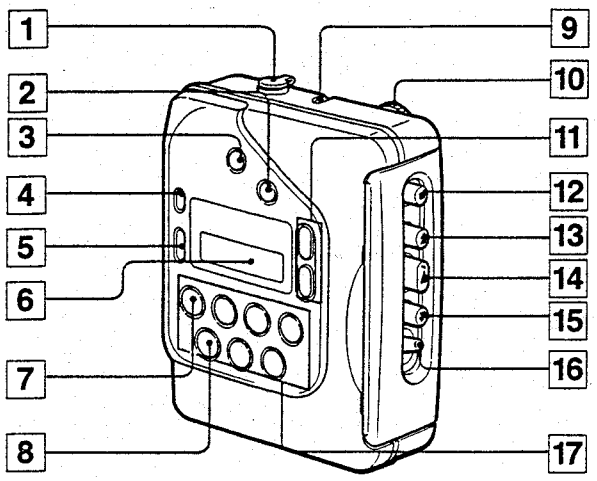
SHOULD ONLY BE CHANGED BY TECHNICAL PERSONNEL. THERE IS A RISK FOR EXPLOSION AT A WRONG HANDLING.

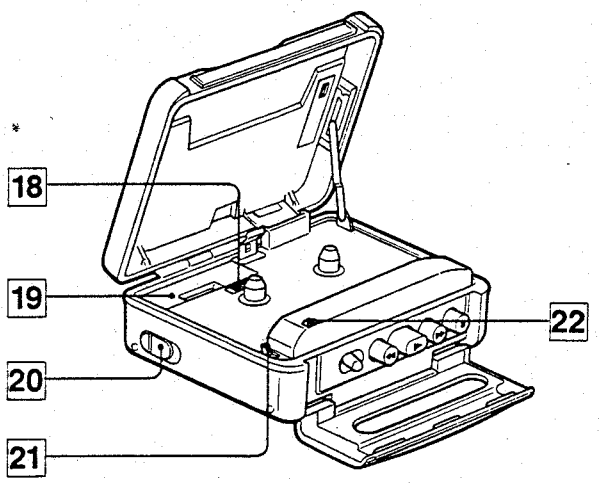
"Batteriet må kun udskiftes med et batteri af samme fabrikat og type".

Because of the risk for explosion the battery must be replaced with the same type and manufacture.

SECTION 1
GENERAL

Parts Identification





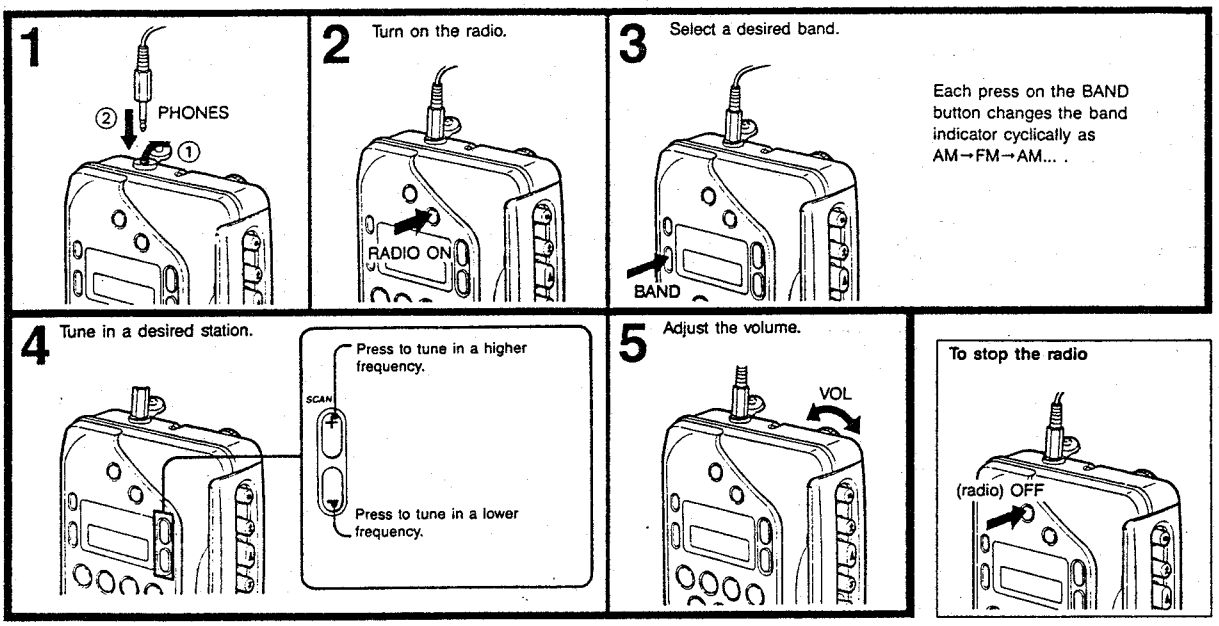
1 PHONES (headphones) jack
2 RADIO ON button
3 (radio) OFF button
4 MEMORY/TIME SET button
5 BAND select button
6 Display window
7 CLOCK button
8 ALARM button
9 OPR/BATT (operation/battery) indicator
10 VOL (volume) control
11 SCAN +/− button
12 ■ STOP button
13 ▲▲ (fast-forward) button
14 ▲ PLAY button
15 ▼▼ (rewind) button
16 DIRECTION (tape transport direction change) selector
17 Preset tuning (channel number) buttons
18 TAPE selector (NORM,CrO_2/ METAL)
19 Battery compartment lid
20 DC IN 3 V (external power input) jack
21 DOLBY NR OFF/ON, FM LOCAL/DX (MONO/ST) selector
22 MODE selector (⇆/⇉)

Features

- The synthesized tuner can:
  — receive a station automatically
  — memorize 7 stations for each FM and AM.
- Auto-reverse function changes the tape playback direction without turning the cassette over.
- Water-resistant design
- Dolby NR* system reduces tape hiss noise during playback.
- TAPE selector for optimum playback with standard tapes as well as high-performance metal tapes

*Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol ⧈ are trademarks of Dolby Laboratories Licensing Corporation.

Radio Reception



To Scan the Stations

There are three ways to scan the stations.

—One step scan

Press a SCAN button repeatedly. You can scan a desired station manually. A beep sound follows each press and the frequency changes in the steps shown below.
AM: 10 kHz
FM: 0.1 MHz
(except for United Kingdom and European countries)

or

AM: 9 kHz
FM: 0.05 MHz

—Seeking scan

When you press the SCAN + or − button for more than half a second, the automatic tuning begins, and then stops automatically when a station is received.
To stop automatic tuning, press the SCAN + or − button again.

—Fast scan

Use the function to rapidly scan a station.
Keep a SCAN button pressed. Fast scanning starts. Release the button when the scanning comes near a desired frequency. The scanning continues in the seeking scan mode.

Notes on radio reception

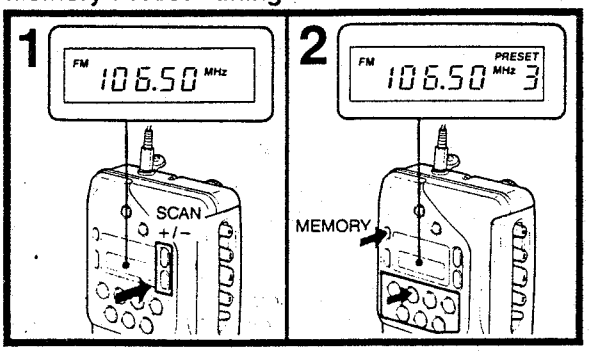
- When you press the tape operation buttons (▲ PLAY, ▲▲ or ▼▼) during radio reception, the indications on the display window will change to the current time display, the radio will be turned off and the unit will go in the tape operation mode. To restore radio reception, press the RADIO ON button again.
- The automatic tuning function may occasionally miss the best setting for a radio station. If this happens, press the SCAN + or − button to adjust the tuning.
- You should remove the cassette tape if it has a metallic cassette shell or labels. Such cassette may cause interference or difficulty in tuning.

When the battery becomes weak while listening to the radio

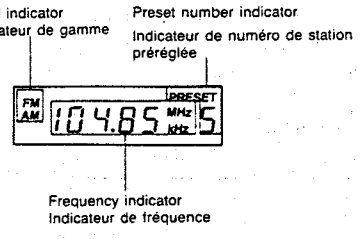
The radio will be turned off. In this case, try playing back a tape. If the "E" indicator appears on the display, replace the batteries with new ones.

When you press the RADIO ON button while listening to the radio, the current time will appear for about two seconds.

Memory Preset Tuning



Display window
Fenêtre d'affichage



To memorize station frequencies

1 Tune in a desired station.

2 Press a desired preset tuning button while keeping the MEMORY button pressed.
The "PRESET" and the preset number indicators you have selected will appear on the display and the station will be memorized.

Repeat steps 1 and 2. Up to 7 stations each can be memorized for each band.
To turn off the radio, press the (radio) OFF button.

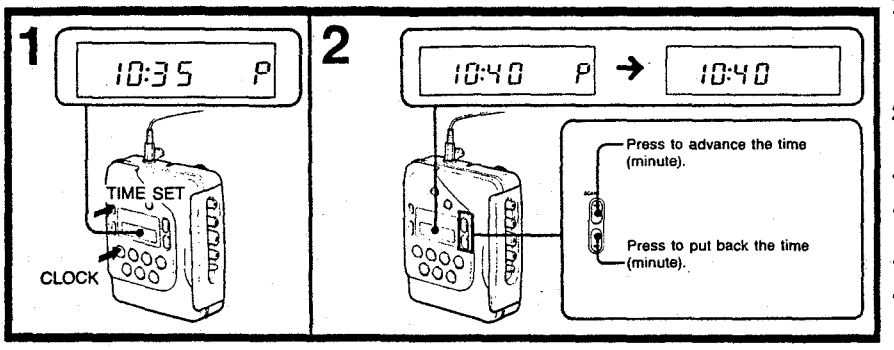
To tune in a preset station

1 Press the RADIO ON button to turn on the radio.
2 Select a desired band by pressing the BAND button.
3 Press a desired preset tuning button.
4 Adjust the volume.

Clock Operation

To Set the Current Time

Be sure to turn off the radio. You cannot set the clock and the alarm during radio reception.

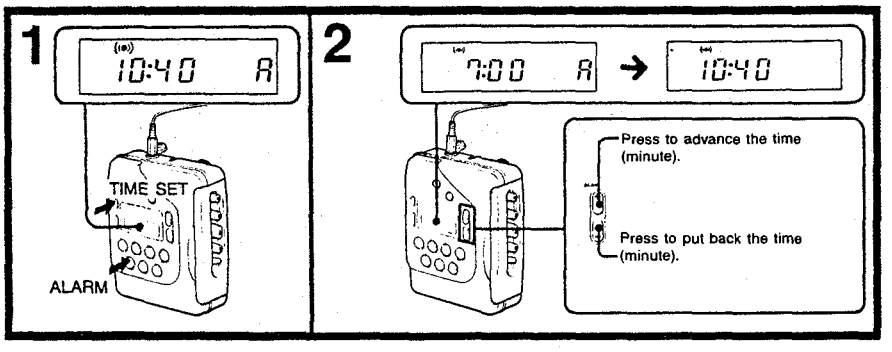


1 Press the CLOCK button (preset tuning button 1) while keeping the TIME SET button pressed. The "P" indicator will appear on the display.
Be sure to keep the TIME SET button pressed until the current time setting is completed.

2 *Set the time.*
After the current time setting is completed, release the TIME SET button. The "P" indicator will disappear.

- When the SCAN + or − button is kept pressed, the digits advance rapidly.
- The hour display is on:
  —a 24-hour cycle (for European countries)
  —a 12-hour cycle (for other countries)
- Replace the batteries within about one hour, or the time you have set will be canceled.
- The hour display advances by one when the minute display returns to "00" after "59".

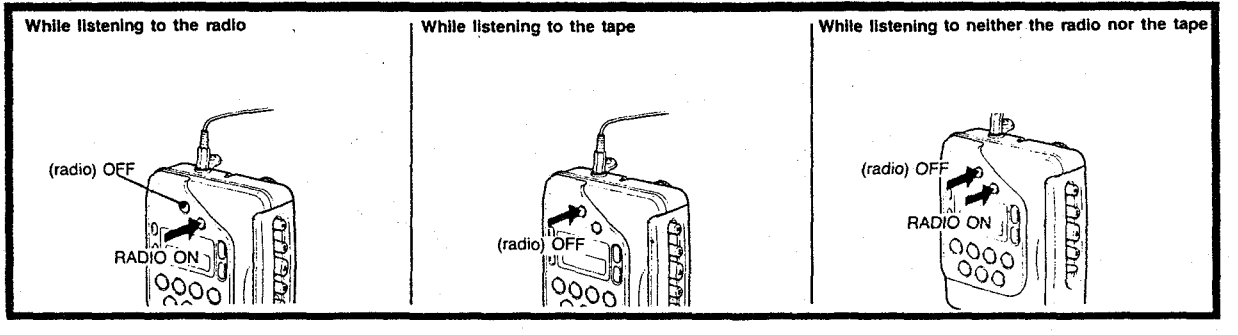
To Set the Alarm



1 Press the ALARM button (preset tuning button 2) while keeping the TIME SET button pressed.
The "A" and "((•))" indicators will appear on the display.
Be sure to keep the TIME SET button pressed until the alarm setting is completed.

2 Set the time.
After the alarm time setting is completed, release the TIME SET button. The display will return to the current time display. The "A" indicator will disappear, but the "((•))" indicator will remain on the display.

To Stop the Alarm



While listening to the radio

The alarm will be heard from the headphones. To stop the alarm, press the RADIO ON button. You can continuously listen to the radio. If you press the (radio) OFF button, the alarm and the radio are both stopped.

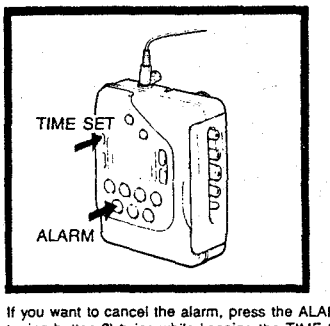
While listening to the tape

The alarm will be heard from the headphones. To stop the alarm, press the (radio) OFF button.

While listening to neither the radio nor the tape

The alarm will be heard from inside the unit (not from the headphones). Press the (radio) OFF button to stop the alarm, or press the RADIO ON button to stop the alarm and to turn on the radio. The "((•))" indicator on the display goes off when you stop the alarm.

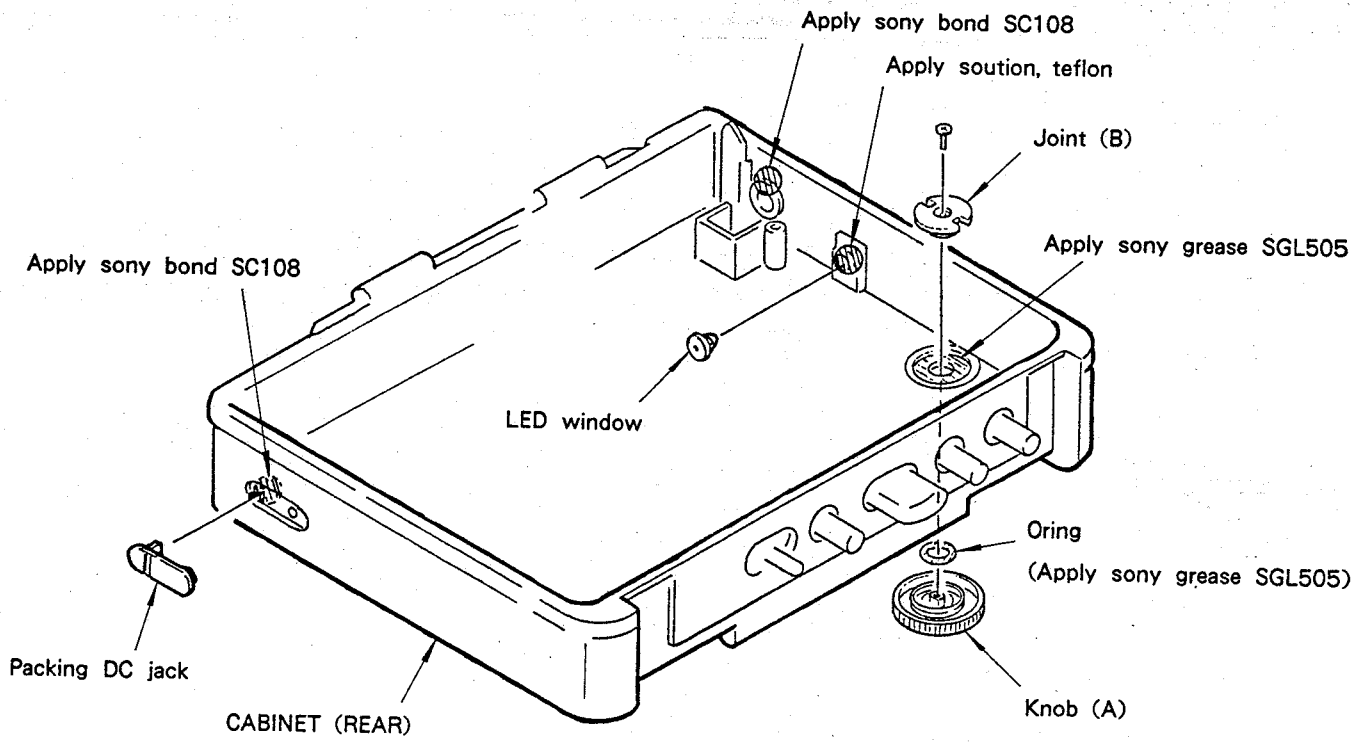
To Cancel the Alarm Setting

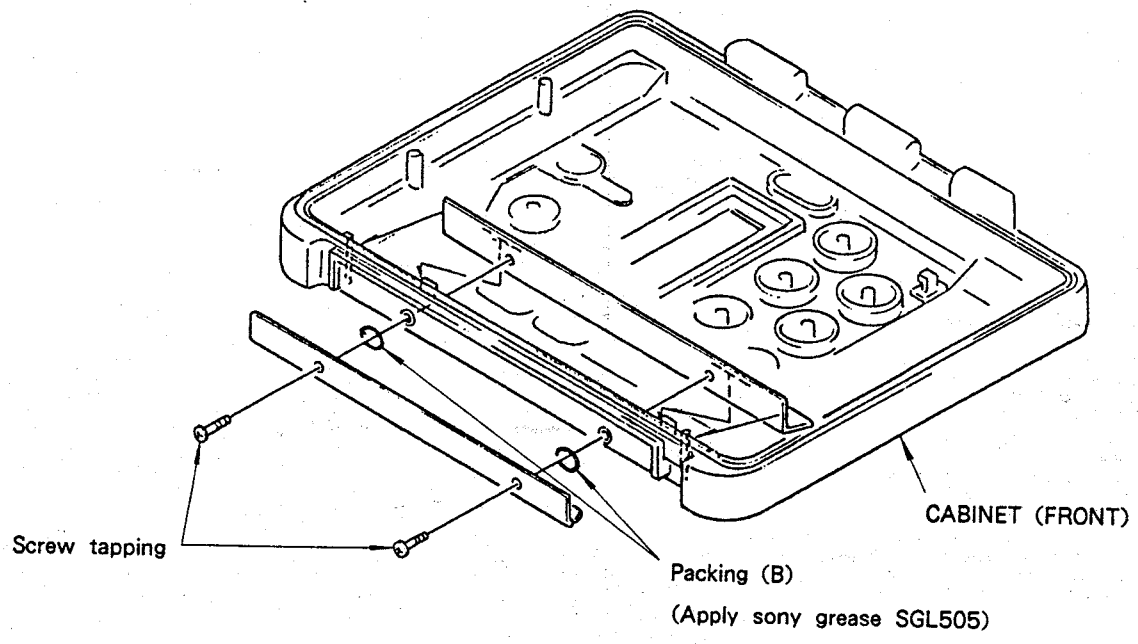


If you want to cancel the alarm, press the ALARM button (preset tuning button 2) twice while keeping the TIME SET button pressed. At the first pressing, the "A", "((•))" and alarm time indicators appear on the display and at the second pressing, the "((•))" indicator goes off and the alarm setting is canceled. Release the TIME SET button to return to the current time display.

SECTION 2
NOTE ON REPAIR

2-1. WATERPROOFED SECTION

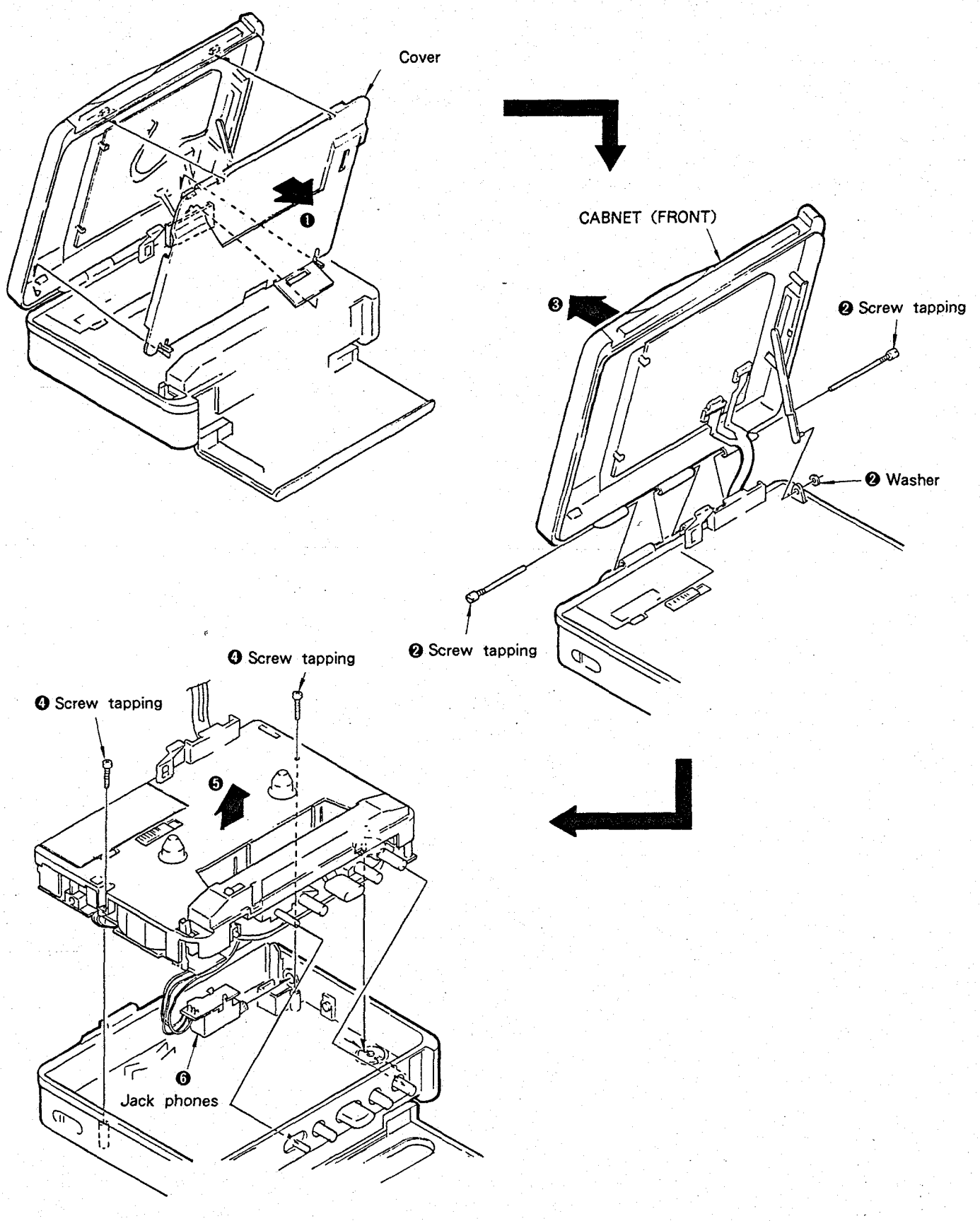




Solution teflon : 7-451-109-02
Sony bond SC108 : 7-432-909-04
Sony grease SGL-505 : 7-662-010-04

SECTION 3
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.



SECTION 4
ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alcohol moistened swab :
   playback — pinch roller
   capstan — rubber belts
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (2.5V) unless otherwise noted.

Torque Measurement

Mode	Torque meter	Meter reading
FWD	CQ-102D	20 — 35g•cm (0.27 — 0.48oz•inch)
FWD Back Tension		less than 3g•cm (less than 0.04oz•inch)
REV	CQ-102RC	20 — 35g•cm (0.27 — 0.48oz•inch)
REV Back Tension		less than 3g•cm (less than 0.04 oz•inch)
FF, REW	CQ-201B	more than 60g•cm (more than 0.83 oz•inch)

Tape Tension Measurement

Mode	Torque meter	Meter reading
FWD	CQ-403A	more than 65g•cm (more than 0.89oz•inch)
REV	CQ-403R	

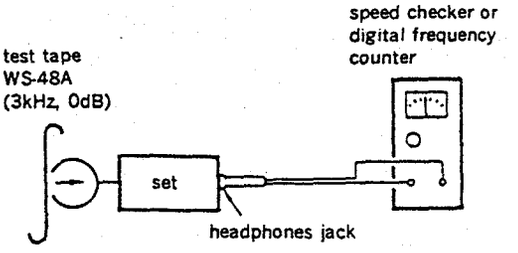
4-2. ELECTRICAL ADJUSTMENTS

CASSETTE SECTION

Tape Speed Adjustment

Procedure :

Mode : playback

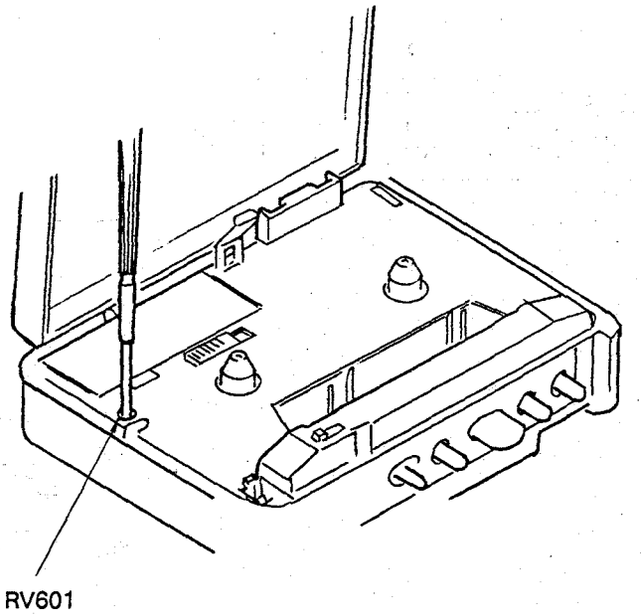


Specification :

speed checker	digital frequency counter
±1%	2,970—3,030Hz

Frequency difference between the beginning and the end of the tape should be within ±2.5% (±75Hz).

Tape Speed Adjustment :

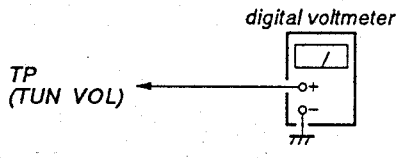


RV601

Radio Section

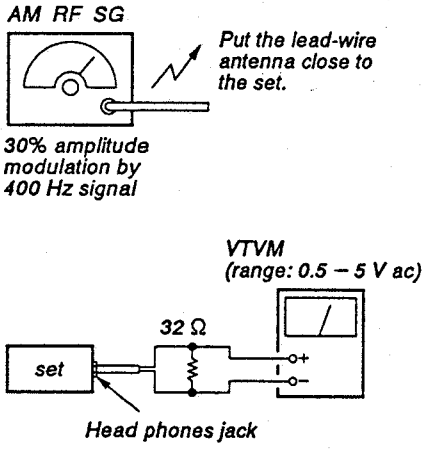
AM SECTION

BAND switch: AM



AM TUNING VOLTAGE ADJUSTMENT	
Adjust for following values on digital voltmeter	
Display indication	AM 530kHz
Digital voltmeter reading	0.80 ± 0.02V
Adjustment part	L5

AM Tracking Adjustment



- Repeat the procedures in each adjustment several times, and the tracking adjustment should be finally done by the trimmer capacitors.

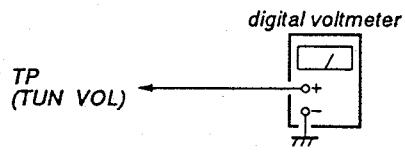
AM TRACKING ADJUSTMENT		
Adjust for a maximum reading on VTVM.		
Display indication	AM 620kHz	AM 1,400kHz
SG frequency	620kHz	1,400kHz
Adjustment part	L1	CT1

AM IF ALIGNMENT	
Adjust for a maximum reading on VTVM.	
SG frequency	1,710kHz
Adjsutment parts	T1

FM SECTION

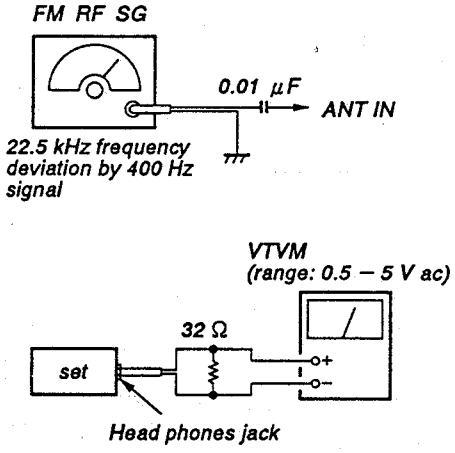
FM Tuning Voltage Adjsutment

BAND switch: FM



FM TUNING VOLTAGE ADJUSTMENT	
Adjust for following values on digital voltmeter	
Display indication	FM 87.5MHz
Digital voltmeter reading	3.20 ± 0.02V
Adjustment part	L4

FM Tracking Adjustment

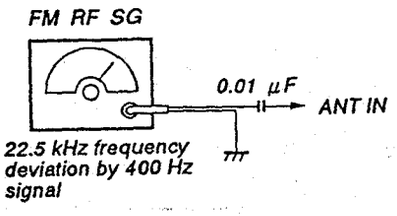


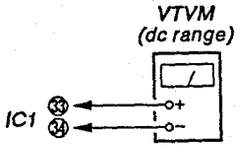
- Repeat the procedures in each adjustment several times, and the tracking adjustment should be finally done by the trimmer capacitors.

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
Display indication	FM 87.5MHz
SG frequency	87.5MHz
Adjustment part	L3

NULL Adjustment

BAND switch: FM

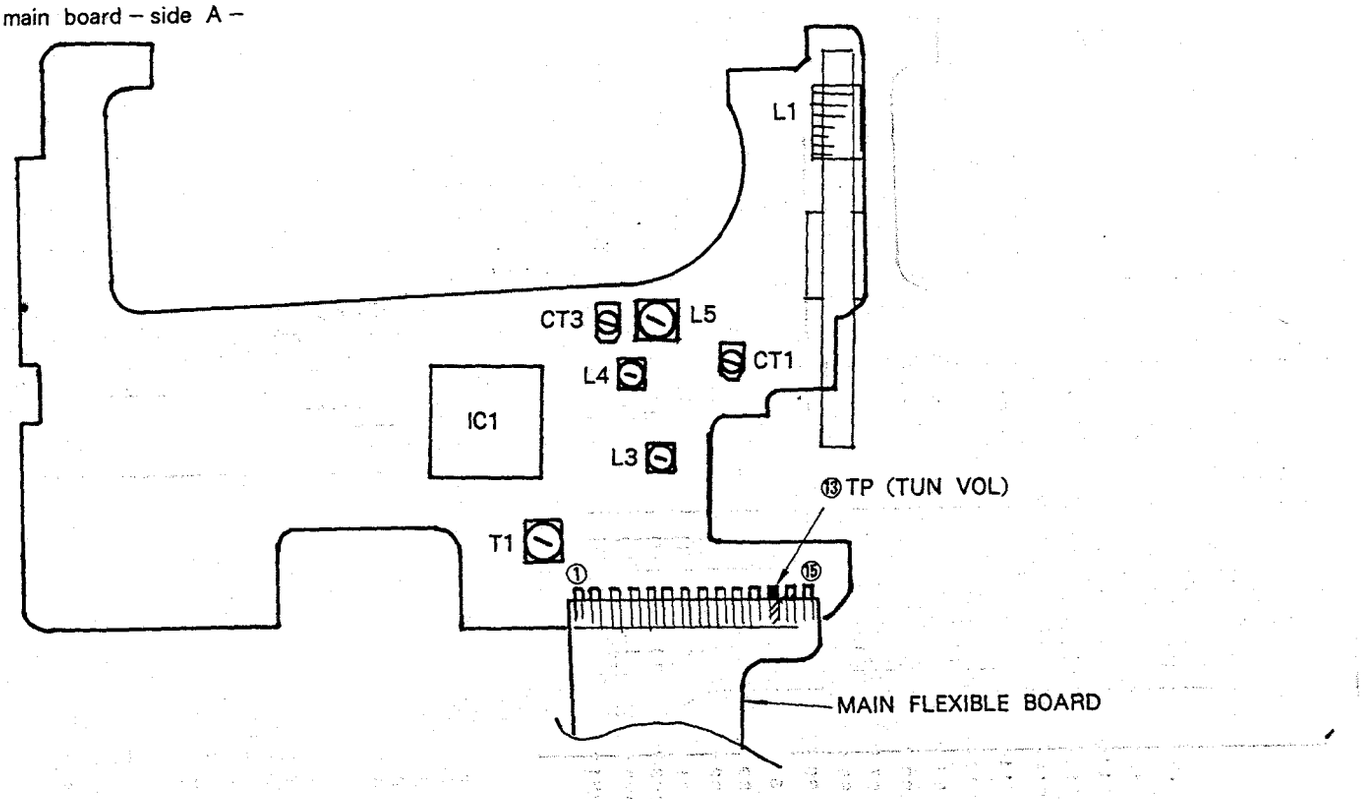




NULL ADJUSTMENT	
Adjust for 0V reading on VTVM.	
Display indication	FM 87.5MHz
SG frequency	87.5MHz
Adjustment part	CT3

Adjustment Location :

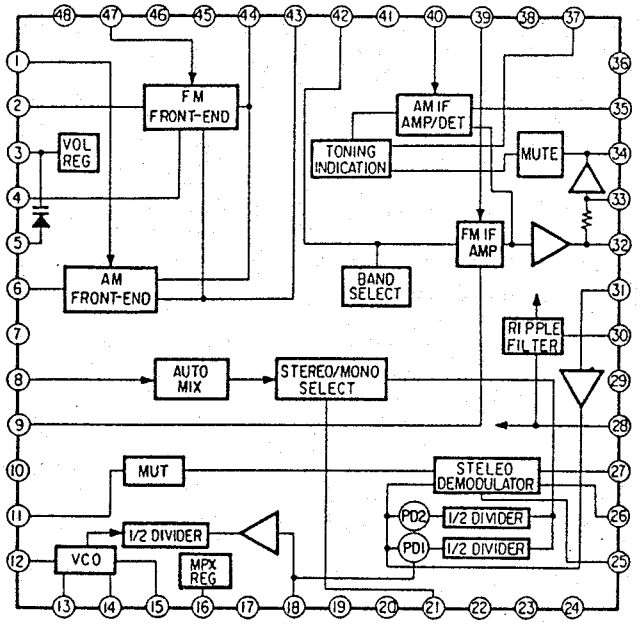
main board – side A –



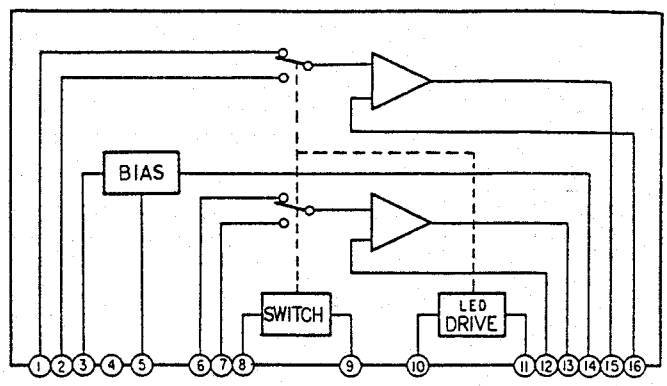
SECTION 5
DIAGRAMS

5-1. IC BLOCK DIAGRAM

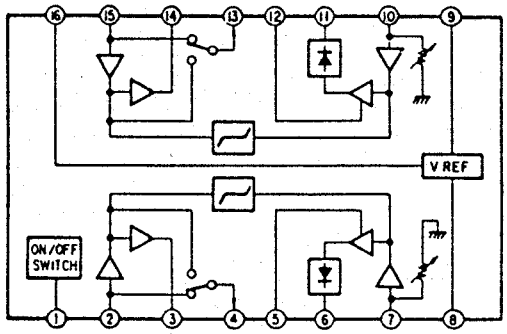
• IC1 CX20029



• IC301 BA3404F

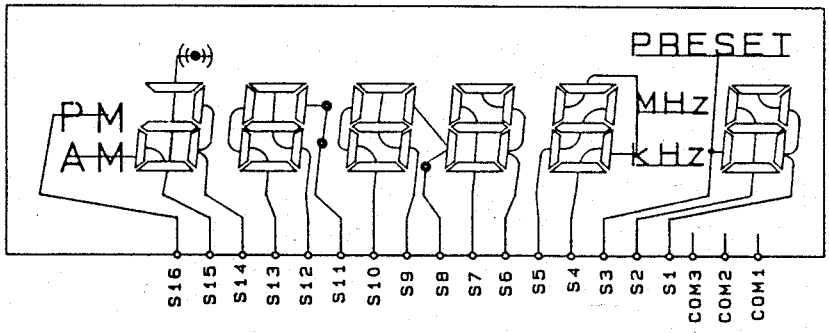


• IC302 NJM-2063AM

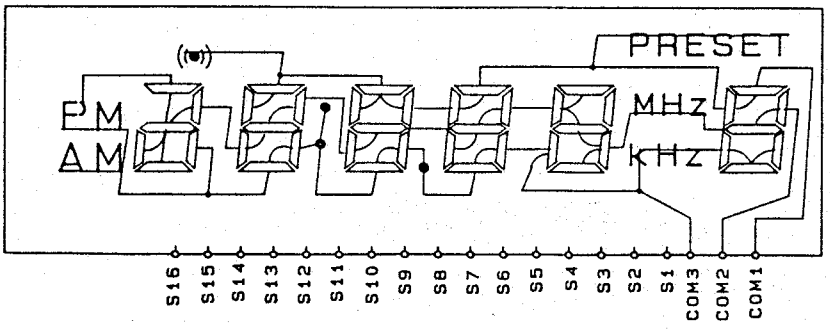


• LCD1

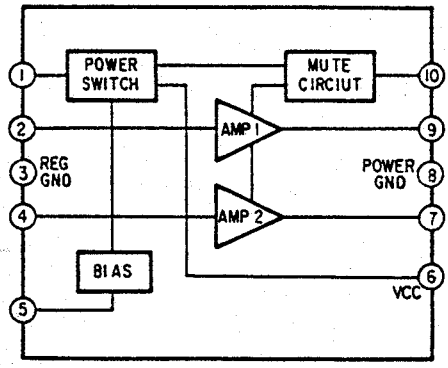
– SEGMENT –



– COMMON –

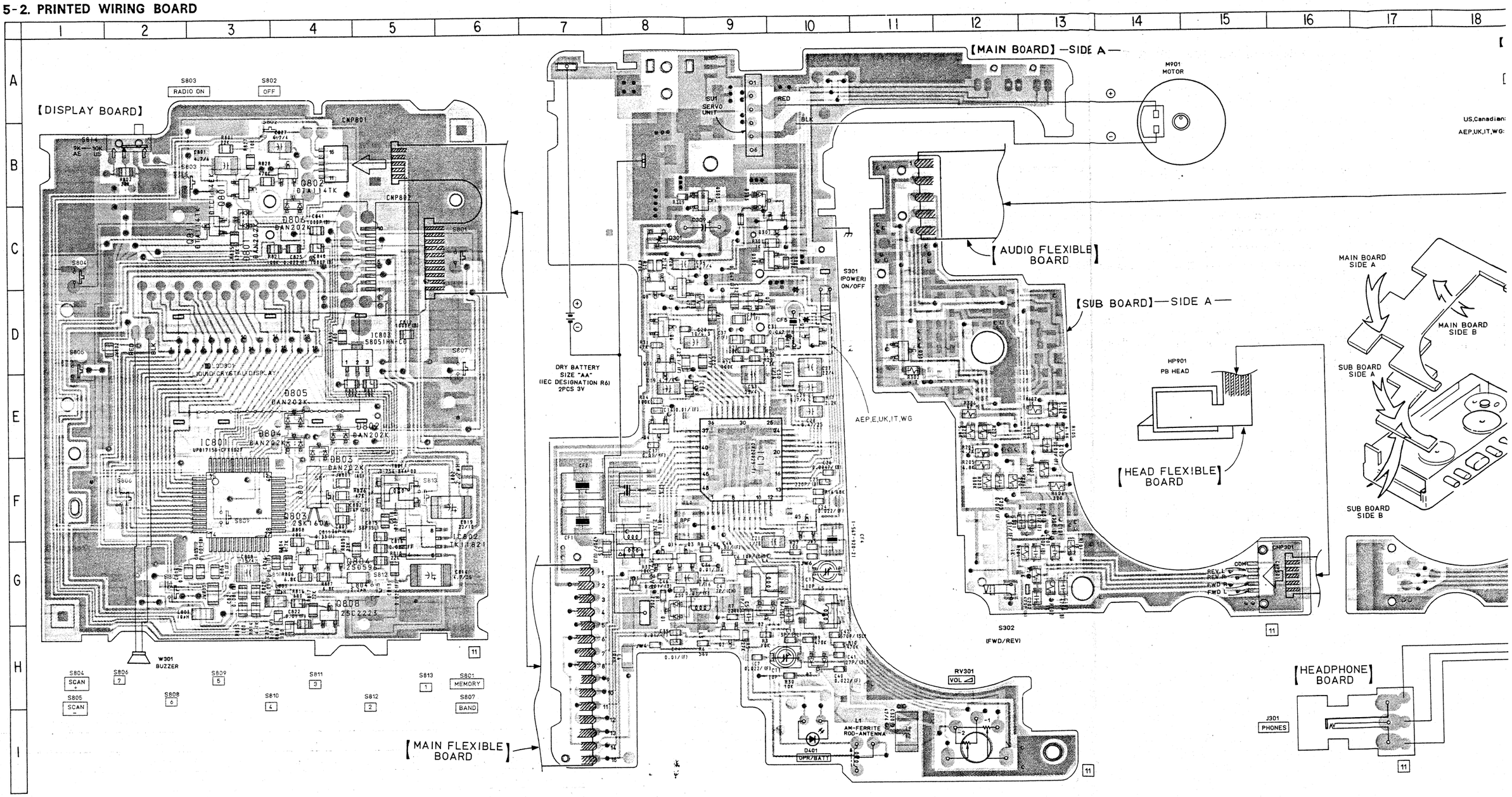


• IC303 LA4533



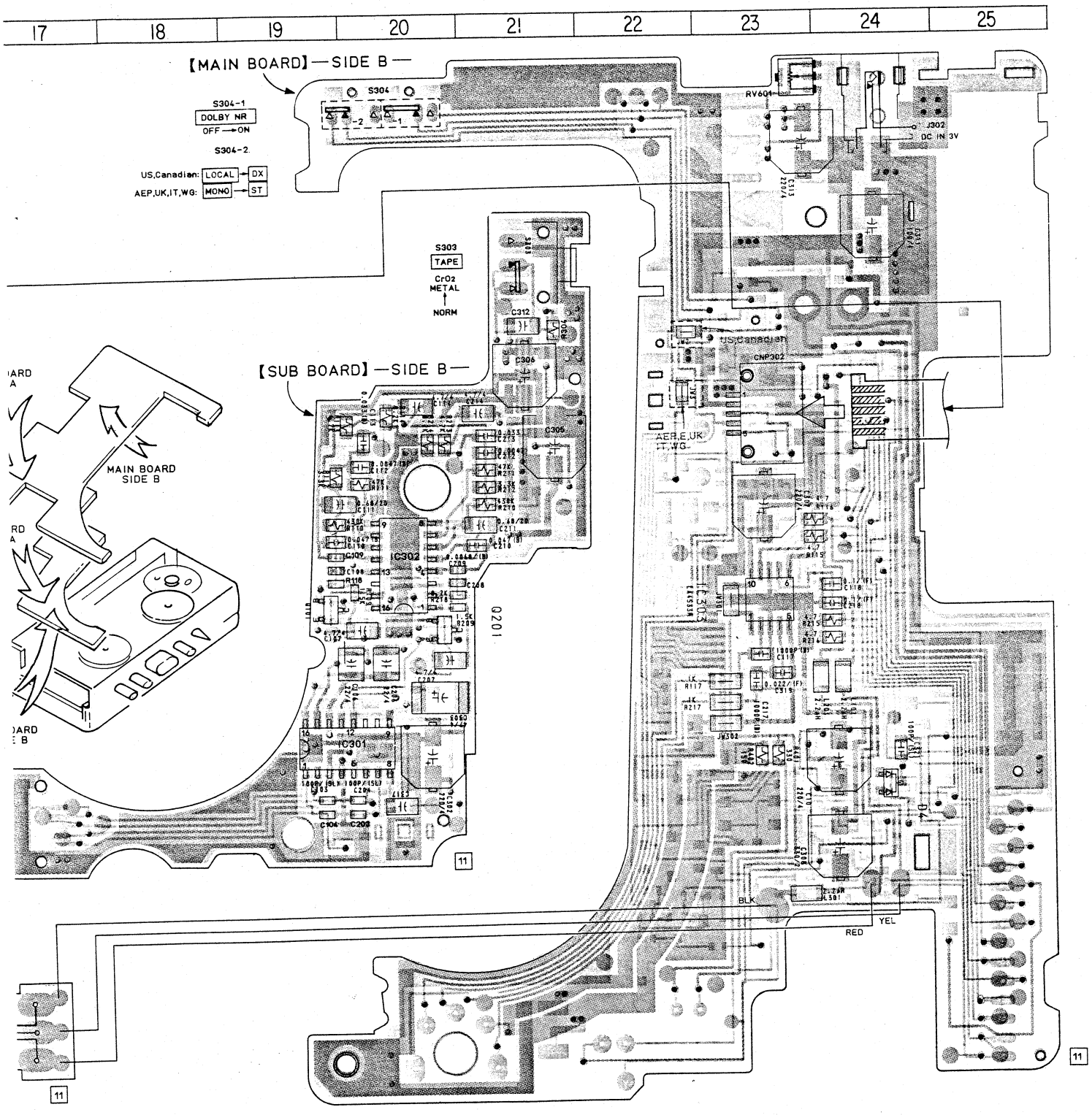
5-2. PRINTED WIRING BOARD

emiconductor Location	
f. No.	Location
01	G-8
02	G-9
03	H-10
04	G-24
0301	C-8
0303	C-9
0401	I-10
9801	C-3
0802	E-4
0803	F-4
0804	E-4
0805	E-4
0806	C-4
C1	F-9
C301	G-19
C302	E-20
C303	E-23
C801	F-3
C802	G-5
C803	D-5
Q1	G-8
Q2	H-9
Q3	G-8
Q4	E-8
Q5	F-10
Q6	D-8
Q7	D-10
Q8	D-8
Q9	D-8
Q10	D-9
Q11	D-8
Q101	E-19
Q201	F-20
Q301	C-10
Q302	C-9
Q303	C-9
Q304	D-11
Q801	B-3
Q802	B-4
Q803	G-4
Q804	G-4
Q808	G-4
Q811	C-3

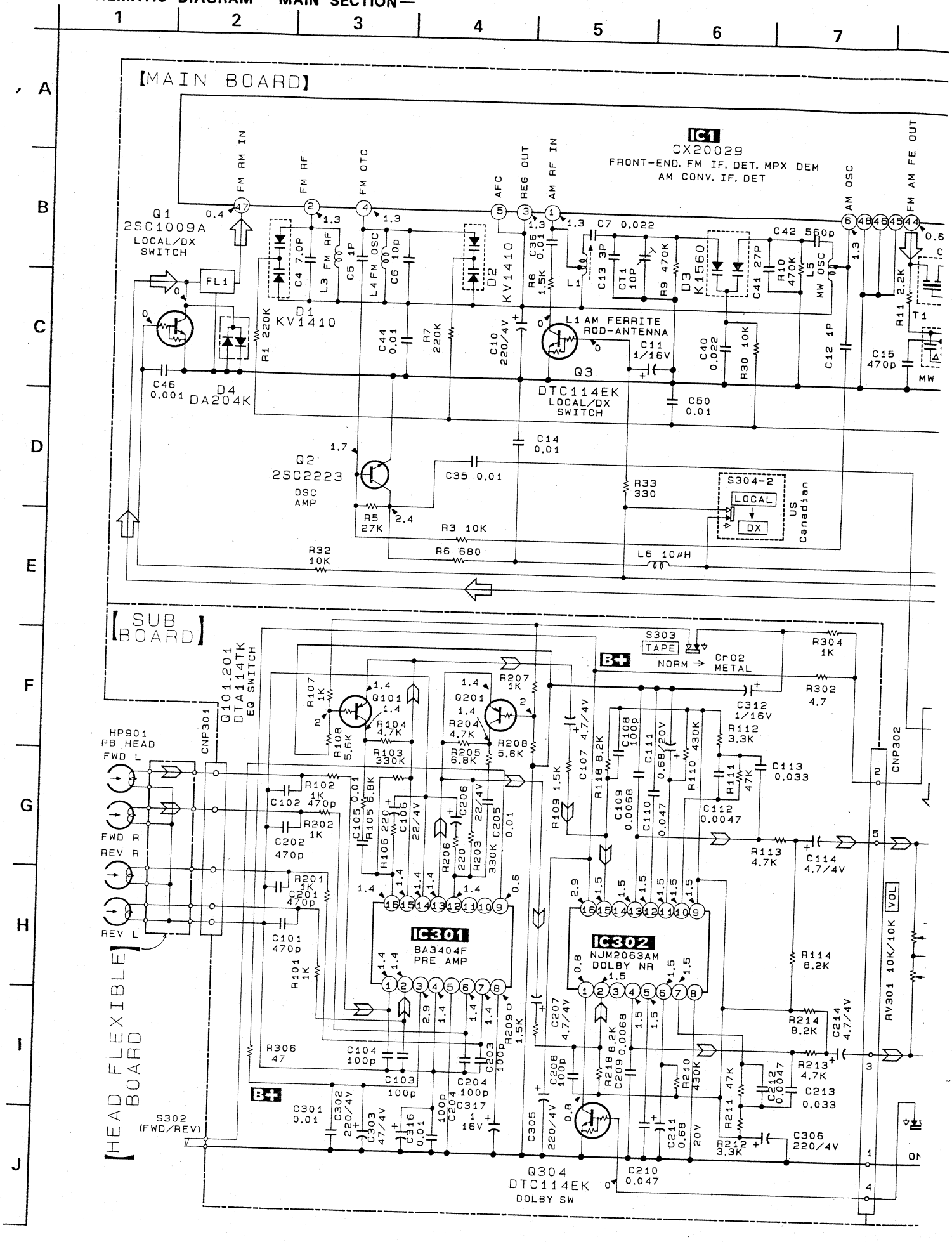


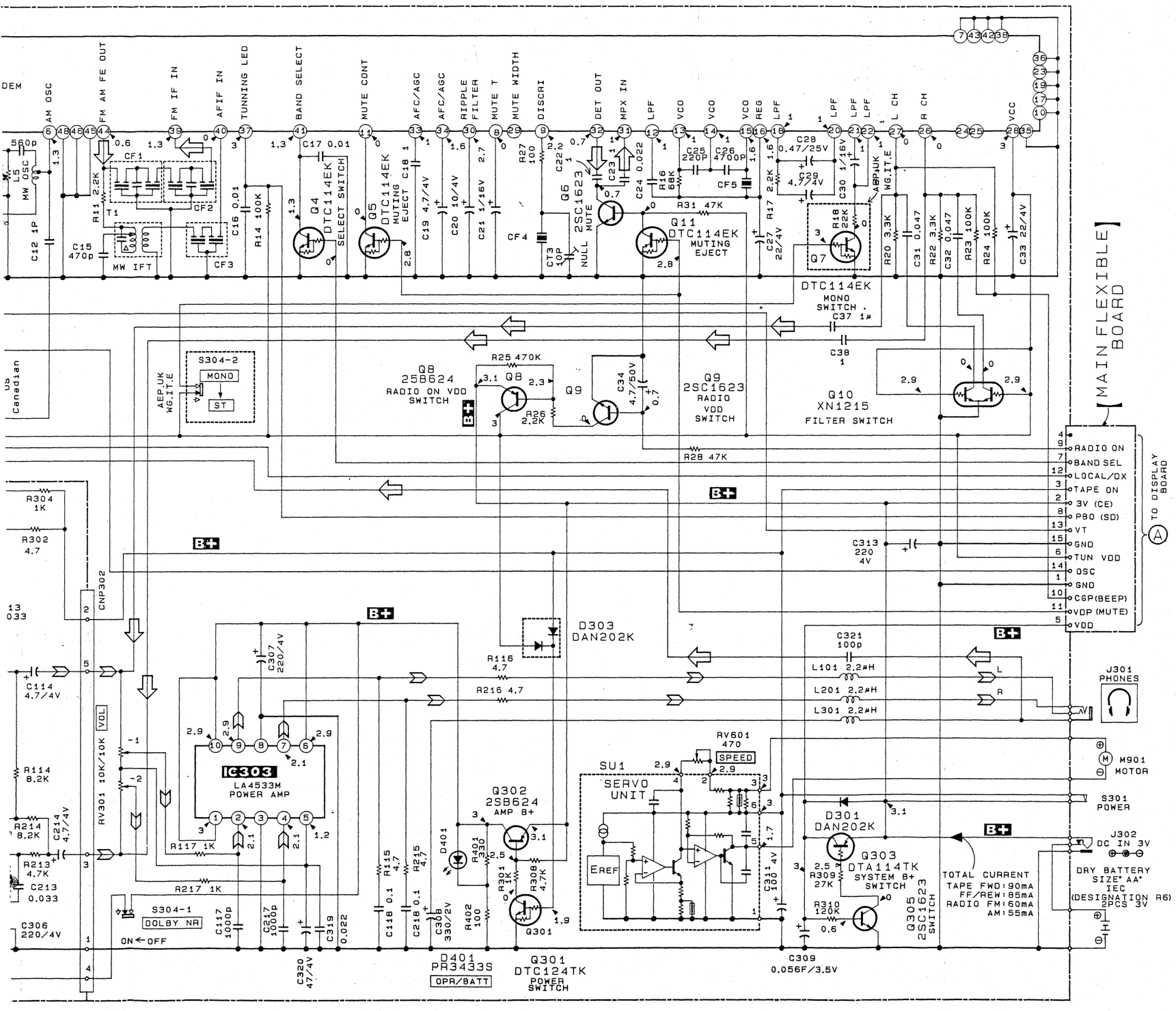
Note on Mounting Diagram:

- ● : Through hole.
- ▒ : Pattern on the side which is seen.
- ▒ : Pattern of the rear side.


17
18
19
20
21
22
23
24
25
【MAIN BOARD】—SIDE B—
S304
S304-1
DOLBY NR
OFF → ON
S304-2
US,Canadian: LOCAL → DX
AEP,UK,IT,WG: MONO → ST
S303
TAPE
CrO2
METAL
NORM
【SUB BOARD】—SIDE B—
MAIN BOARD
SIDE B
RV604
J302
DC IN 3V
CNP302
US,Canadian
AER,E,UK
IT,WG
IC302
IC303
IC301
Q201
BLK
YEL
RED
11

5-3. SCHEMATIC DIAGRAM —MAIN SECTION—



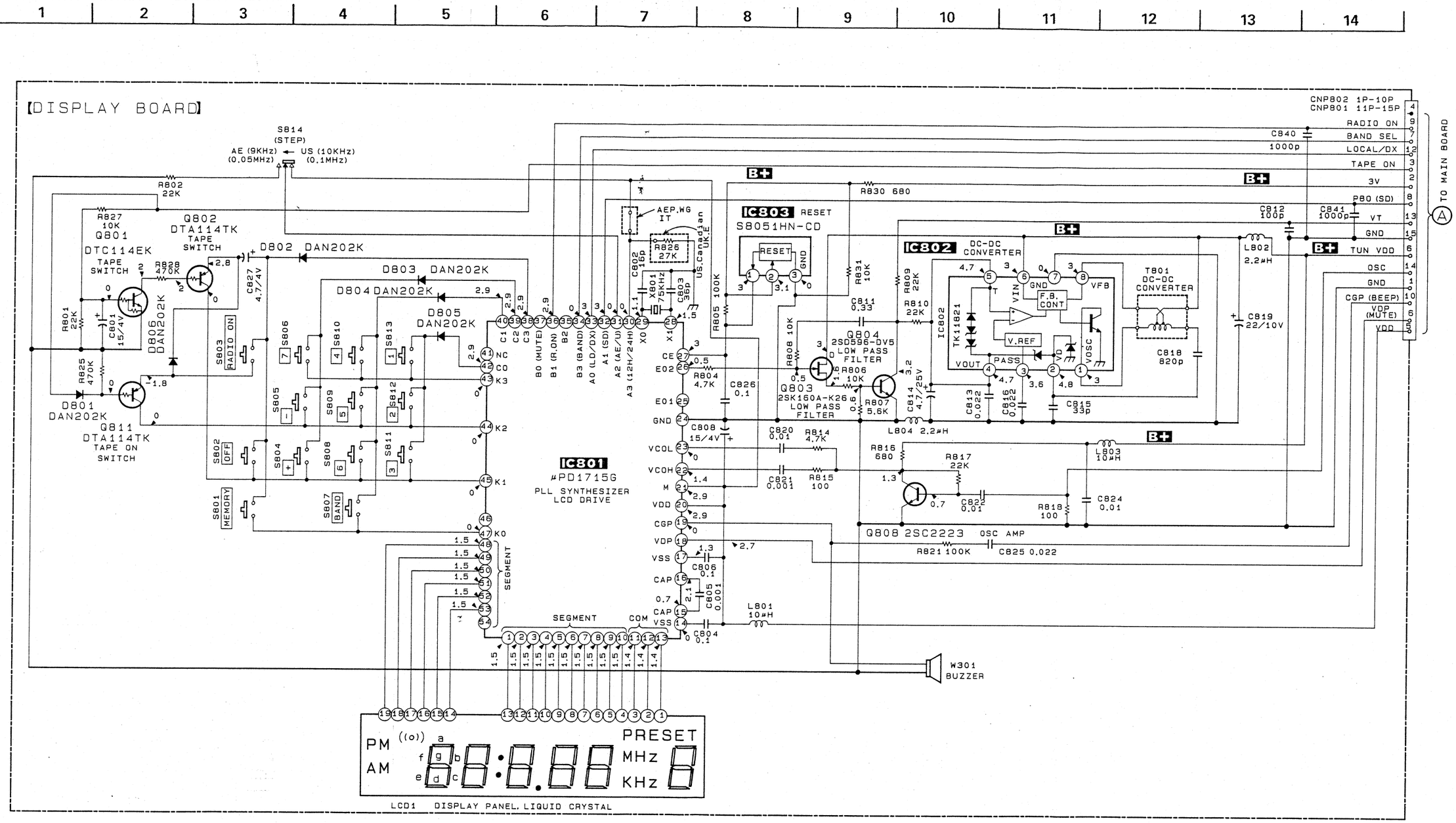


Note on Schematic Diagram:

- All capacitors are in μF unless noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- B+ : B+ Line
- B− : B− Line
- ▭ : adjustment for repair
- Total current is measured with no cassette installed.
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FWD. FM
- Voltages are taken with a VOM (Input impedance 10MΩ) Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM ⇦ : PB

WG : West Germany Model
IT : Italian Model

5-4. SCHEMATIC DIAGRAM —DISPLAY SECTION—



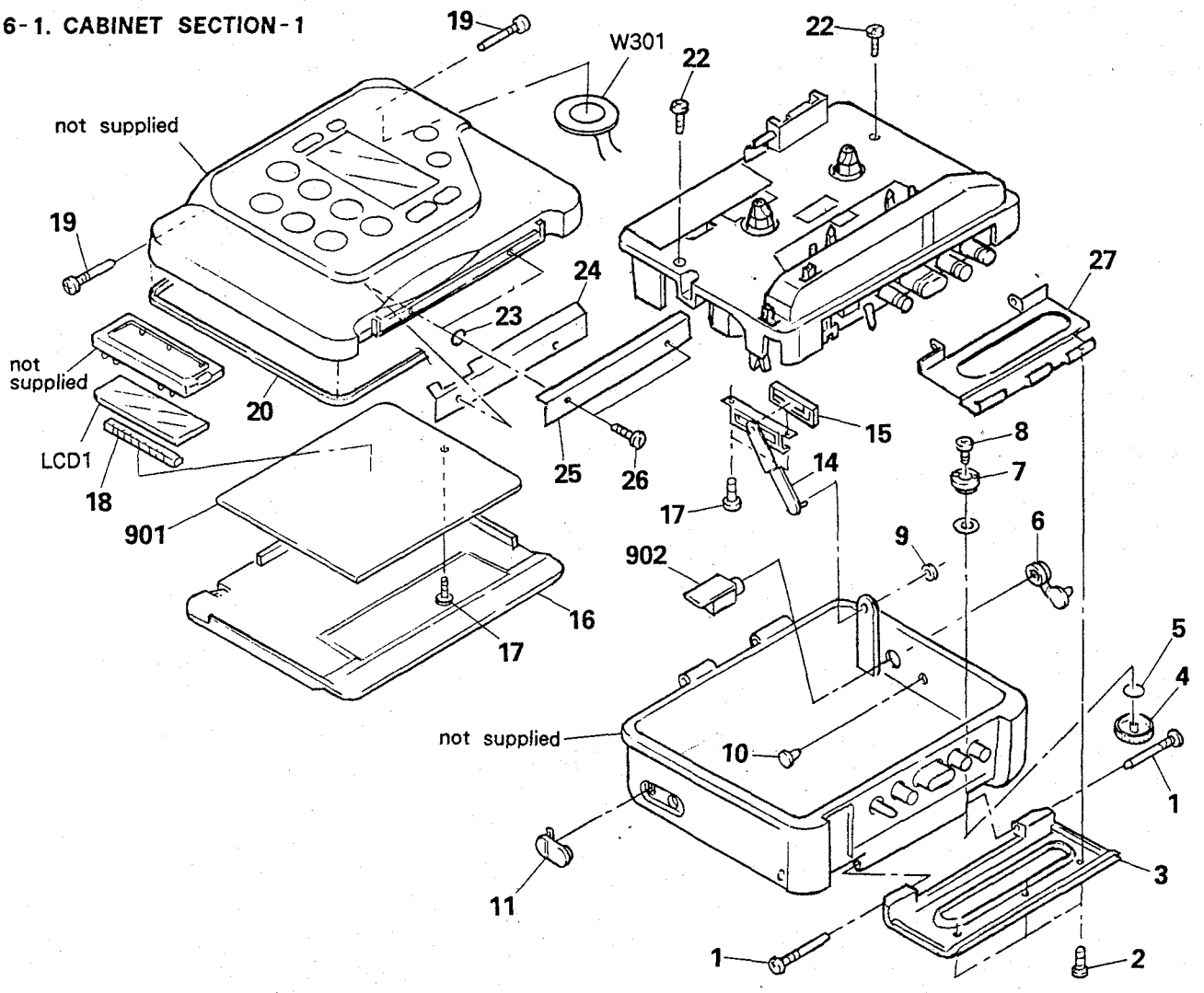
SECTION 6
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) ... KNOB, BALANCE (WHITE)
  ↑ Cabinet's Color ↑ Parts' Color

WG : West Germany Model
IT : Italian Model

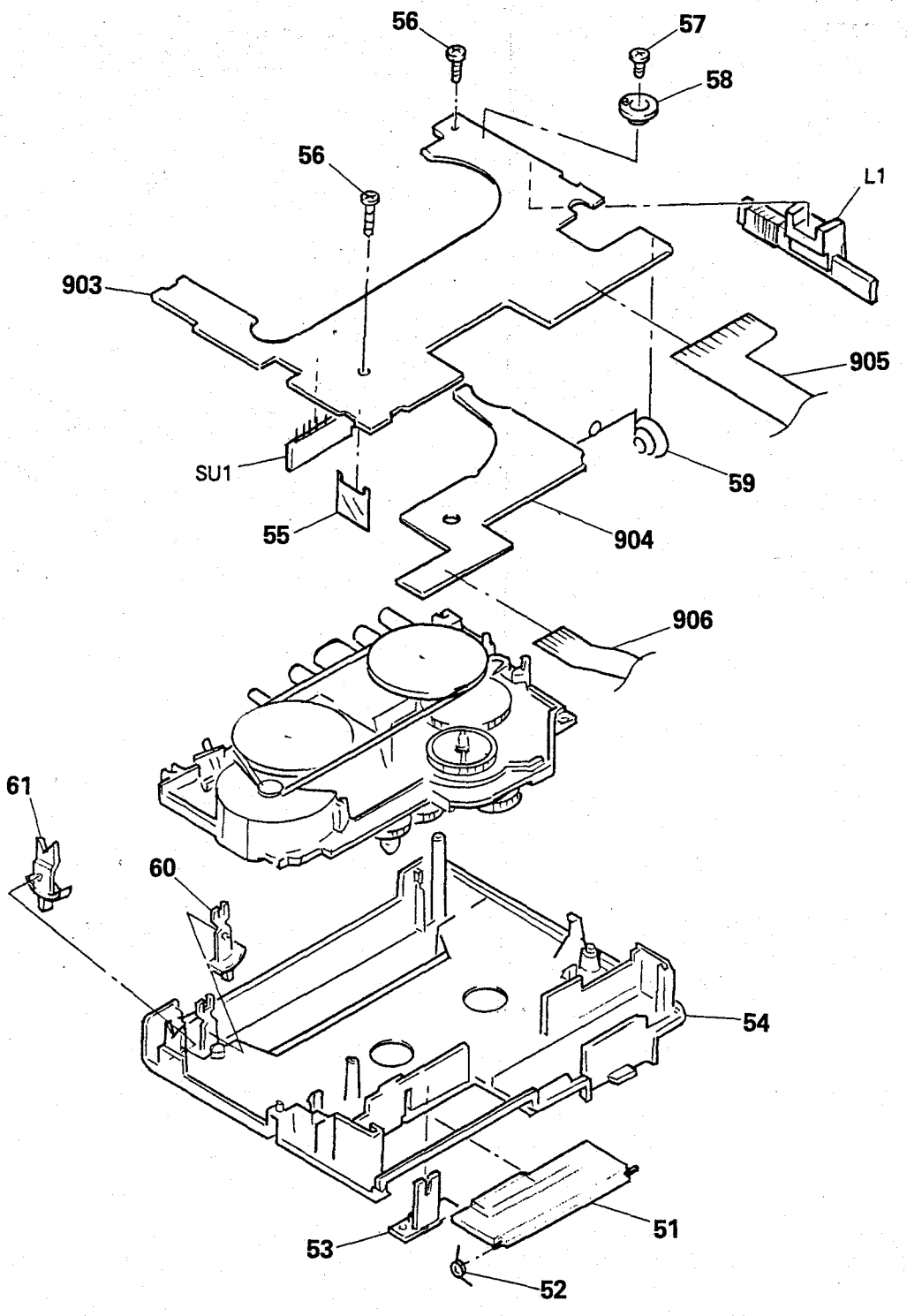
6-1. CABINET SECTION-1



No.	Part No.	Description	Remarks
1	3-326-536-11	SCREW, TAPPING	
2	3-704-243-11	SCREW (P1.7X2.0)	
3	3-357-488-01	BUCKLE	
4	3-357-466-01	KNOB (A)	
5	3-326-573-01	RING (DIA.4.9X DIA.7.1), 0	
6	3-326-520-01	PACKING, HP JACK	
7	3-357-469-01	JOINT (B)	
8	3-318-201-51	SCREW (B) (1.4X4), TAPPING	
9	3-578-242-11	WASHER	
10	3-326-519-01	WINDOW, LED	
11	3-312-826-00	PACKING, DC JACK	
14	X-3347-198-1	ARM ASSY, CLICK	
15	3-357-486-01	SPRING, CLICK	
16	3-357-487-01	(US,Canadian,E,UK)...COVER	
	3-357-487-11	(AEP,WG,IT).....COVER	

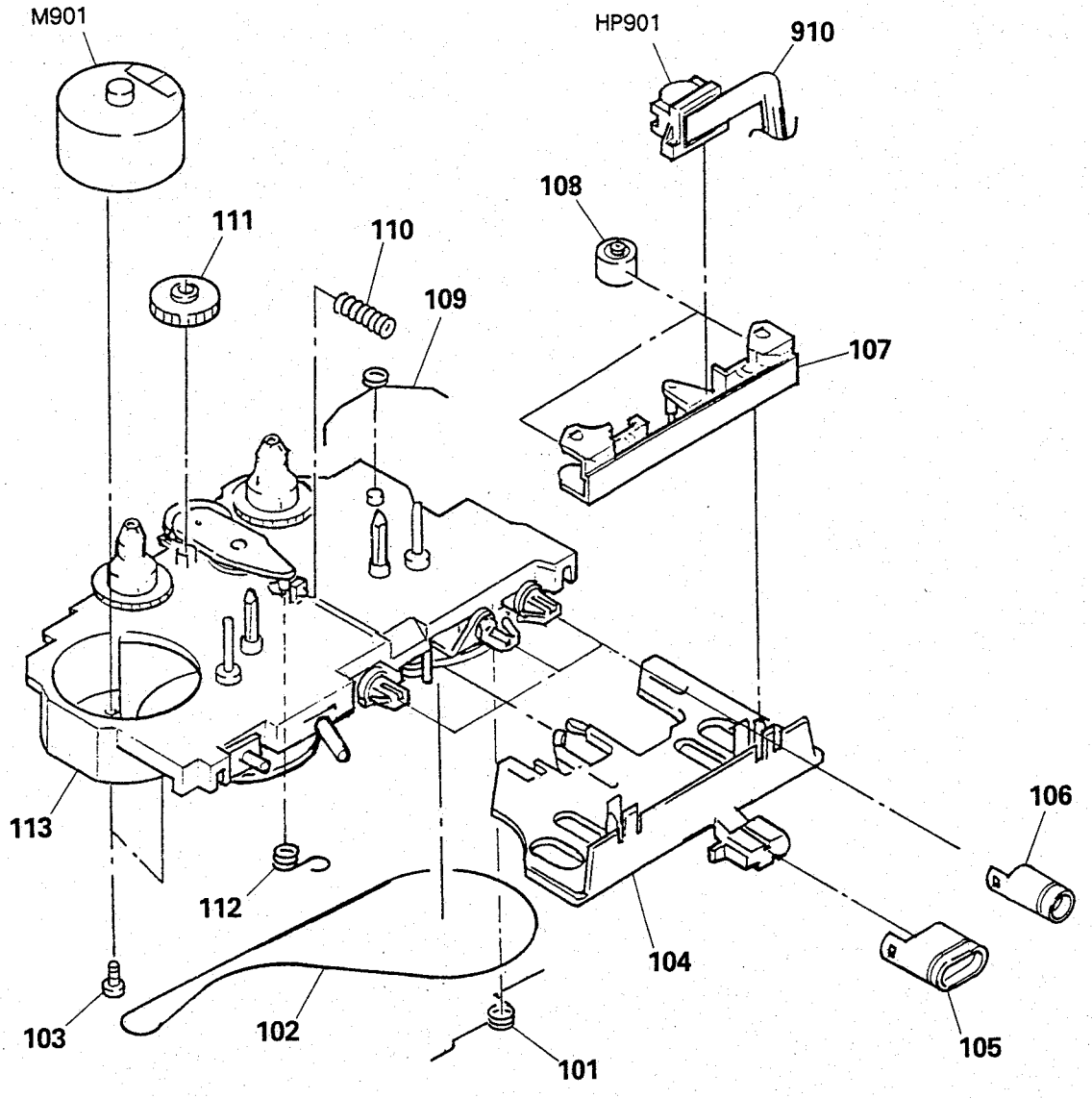
No.	Part No.	Description	Remarks
17	3-318-382-11	SCREW (1.7X4.5), TAPPING	
18	1-535-749-11	CONDUCTOR (CONNECTION)	
19	3-357-460-01	SCREW, TAPPING	
20	3-351-134-01	PACKING, CABINET	
22	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT	
23	3-326-149-01	PACKING (B)	
24	3-357-472-01	REINFORCEMENT (B)	
25	3-357-471-01	REINFORCEMENT (A)	
26	3-326-145-11	SCREW (M1.7X5.8)	
27	3-357-484-01	BRACKET (BUCKLE)	
901	A-3289-743-A	(US,Canadian,E,UK)..PC BOARD ASSY, DISPLAY	
	A-3289-789-A	(AEP,WG,IT).....PC BOARD ASSY, DISPLAY	
902	*1-634-131-11	PC BOARD, HEADPHONE	
LCD1	1-808-971-11	DISPLAY PANEL, LIQUID CRYSTAL	
W301	1-529-084-11	BUZZER	

6-2. CABINET SECTION-2



No.	Part No.	Description	Remarks
51	3-357-477-01	LID, BATTERY CASE	
52	3-357-464-01	SPRING, TORSION	
53	3-357-467-01	KNOB (B)	
54	3-357-491-01	(US,Canadian).....CHASSIS	
	3-357-491-11	(WG,IT,UK,E,AEP)...CHASSIS	
55	3-357-470-01	TERMINAL BOARD, BATTERY	
56	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT	
57	3-318-201-51	SCREW (B) (1.4X4), TAPPING	
58	3-357-468-01	JOINT (A)	
59	3-357-483-01	SPRING, BATTERY COIL	
60	3-357-479-01	JOINT (C)	
61	3-357-478-01	KNOB (C)	
903	A-3261-120-A	(US,Canadian).....PC BOARD ASSY, MAIN	
	A-3261-190-A	(AEP,UK,WG,IT,E)...PC BOARD ASSY, MAIN	
904	A-3289-744-A	PC BOARD ASSY, SUB	
906	1-635-388-11	PC BOARD, FLEXIBLE (AUDIO)	
L1	1-402-487-11	ANTENNA, FERRITE-ROD	
SU1	1-466-100-11	SERVO UNIT	

6-3. MECHANISM SECTION
(MF-WMF2078-19)



No.	Part No.	Description	Remarks
101	3-360-021-01	SPRING (STOP), TORSION	
102	3-351-599-11	BELT	
103	3-352-758-01	SCREW (M1.7X1.8), TOOTHED LOCK	
104	3-351-733-01	LEVER, PLAY	
105	*3-357-481-01	BUTTON (B)	
106	*3-357-480-01	BUTTON (A)	
107	3-351-732-01	PINCH LEVER	
108	3-352-737-01	PINCH ROLLER	
109	3-351-710-01	SPRING (PREVENTION), TORSION	
110	3-360-020-01	SPRING, COMPRESSION	
111	3-351-597-01	GEAR (R)	
112	3-351-706-41	SPRING (T), TORSION	
113	X-3346-795-1	CHASSIS SUB ASSY	
910	1-630-959-11	PC BOARD, FLEXIBL	
HP901	1-543-596-11	HEAD, MAGNETIC (PLAYBACK)	
M901	1-541-648-11	MOTOR, DC	

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

WG : West Germany Model
IT : Italian Model

Ref.No.	Part No.	Description		
901	A-3289-743-A	(US,Canadian,E,UK) ...PC BOARD ASSY, DISPLAY		
	A-3289-789-A	(AEP,WG,IT)....PC BOARD ASSY, DISPLAY		
902	*1-634-131-11	PC BOARD, HEADPHONE		
903	A-3261-120-A	(US,Canadian).....PC BOARD ASSY, MAIN		
	A-3261-190-A	(AEP,UK,WG,IT,E)...PC BOARD ASSY, MAIN		
904	A-3289-744-A	PC BOARD ASSY, SUB		
906	1-635-388-11	PC BOARD, FLEXIBLE (AUDIO)		
910	1-630-959-11	PC BOARD, FLEXIBL		
C4	1-162-912-11	CERAMIC CHIP 7PF	0.5PF	50V
C5	1-163-083-00	CERAMIC CHIP 1PF	0.25PF	50V
C6	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C7	1-162-995-11	CERAMIC CHIP 0.022MF		50V
C10	1-126-246-11	ELECT CHIP 220MF	20%	4V
C11	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C12	1-163-083-00	CERAMIC CHIP 1PF	0.25PF	50V
C13	1-162-934-11	CERAMIC CHIP 3PF	0.25PF	50V
C14	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C15	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C16	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C17	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C18	1-164-346-11	CERAMIC CHIP 1MF		16V
C19	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C20	1-135-201-11	TANTAL. CHIP 10MF	20%	4V
C21	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C22	1-164-346-11	CERAMIC CHIP 1MF		16V
C23	1-164-346-11	CERAMIC CHIP 1MF		16V
C24	1-162-995-11	CERAMIC CHIP 0.022MF		50V
C25	1-162-960-11	CERAMIC CHIP 220PF	10%	50V
C26	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C27	1-135-202-21	TANTAL. CHIP 22MF	20%	4V
C28	1-135-145-11	TANTAL. CHIP 0.47MF	20%	25V
C29	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C30	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C31	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C32	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C33	1-135-202-21	TANTAL. CHIP 22MF	20%	4V
C34	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C35	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C36	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C37	1-164-346-11	CERAMIC CHIP 1MF		16V
C38	1-164-346-11	CERAMIC CHIP 1MF		16V
C40	1-162-995-11	CERAMIC CHIP 0.022MF		50V
C41	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C42	1-164-363-11	CERAMIC CHIP 5600PF		50V

Ref.No.	Part No.	Description		
C44	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C46	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C50	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C101	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C102	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C103	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C104	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C105	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C106	1-135-202-21	TANTAL. CHIP 22MF	20%	4V
C107	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C108	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C109	1-162-969-11	CERAMIC CHIP 0.0068MF	10%	25V
C110	1-163-809-11	CERAMIC CHIP 0.047MF	5%	25V
C111	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V
C112	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C113	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V
C114	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C117	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C118	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C201	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C202	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C203	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C204	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C205	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C206	1-135-202-21	TANTAL. CHIP 22MF	20%	4V
C207	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C208	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C209	1-162-969-11	CERAMIC CHIP 0.0068MF	10%	25V
C210	1-163-809-11	CERAMIC CHIP 0.047MF	5%	25V
C211	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V
C212	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C213	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V
C214	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C217	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C218	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C301	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C302	1-126-246-11	ELECT CHIP 220MF	20%	4V
C303	1-135-163-21	TANTAL. CHIP 47MF	20%	4V
C305	1-126-246-11	ELECT CHIP 220MF	20%	4V
C306	1-126-246-11	ELECT CHIP 220MF	20%	4V
C307	1-126-246-11	ELECT CHIP 220MF	20%	4V
C308	1-126-608-11	ELECT 330MF	20%	2V
C309	1-125-639-11	DOUBLE LAYERS 0.056F		3.5V
C311	1-126-209-11	ELECT CHIP 100MF	20%	4V
C312	1-135-091-00	TANTAL. CHIP 1MF	20%	16V

Ref.No.	Part No.	Description		
C313	1-126-246-11	ELECT CHIP 220MF	20%	4V
C316	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C317	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C319	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C320	1-135-163-21	TANTAL. CHIP 47MF	20%	4V
C321	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C801	1-135-158-21	TANTAL. CHIP 15MF	10%	4V
C802	1-163-098-00	CERAMIC CHIP 16PF	5%	50V
C803	1-163-106-00	CERAMIC CHIP 36PF	5%	50V
C804	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C805	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C806	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C808	1-135-158-21	TANTAL. CHIP 15MF	10%	4V
C811	1-164-336-11	CERAMIC CHIP 0.33MF		25V
C812	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C813	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C814	1-135-085-21	TANTAL. CHIP 4.7MF	20%	25V
C815	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C816	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C818	1-163-139-00	CERAMIC CHIP 820PF	10%	50V
C819	1-135-161-21	TANTAL. CHIP 22MF	10%	10V
C820	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C821	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C822	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C824	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C825	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C826	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C827	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C840	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C841	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
CF1	1-567-910-11	FILTER, CERAMIC		
CF2	1-567-910-11	FILTER, CERAMIC		
CF3	1-577-261-21	FILTER, CERAMIC		
CF4	1-577-065-11	FILTER, CERAMIC		
CF5	1-567-164-00	VIBRATOR, CERAMIC		
CNP301	1-565-370-11	HOUSING, CONNECTOR 5P		
CNP302	1-565-370-11	HOUSING, CONNECTOR 5P		
CNP801*	1-565-370-11	HOUSING, CONNECTOR 5P		
CNP802*	1-569-470-21	HOUSING, CONNECTOR 10P		
CT1	1-141-373-11	CAP, TRIMMER		
CT3	1-141-373-11	CAP, TRIMMER		
D1	8-719-984-03	DIODE KV1410		
D2	8-719-984-03	DIODE KV1410		
D3	8-719-951-05	DIODE KV1560		

Ref.No.	Part No.	Description
D4	8-719-800-76	DIODE 1SS226
D301	8-719-400-18	DIODE MA152WK
D303	8-719-400-18	DIODE MA152WK
D401	8-719-976-04	DIODE PR3433S
D801	8-719-400-18	DIODE MA152WK
D802	8-719-400-18	DIODE MA152WK
D803	8-719-400-18	DIODE MA152WK
D804	8-719-400-18	DIODE MA152WK
D805	8-719-400-18	DIODE MA152WK
D806	8-719-400-18	DIODE MA152WK
FL1	1-236-053-11	FILTER, BAND PASS
HP901	1-543-596-11	HEAD, MAGNETIC (PLAYBACK)
IC1	8-752-039-99	IC CX20029
IC301	8-759-909-64	IC BA3404F
IC302	8-759-701-07	IC NJM2063AM
IC303	8-759-802-75	IC LA4533M
IC801	8-759-149-11	IC UPD1715G-621-22
IC802	8-759-999-91	IC TK11821M
IC803	8-759-947-95	IC S-8051HN-CDS
J301	1-565-376-11	JACK, HEADPHONE
J302	1-569-412-11	JACK, EXTERNAL POWER
JW3	1-216-295-00	METAL GLAZE 0 5% 1/10W
JW4	1-216-864-11	METAL GLAZE 0 5% 1/16W
JW5	1-216-864-11	METAL GLAZE 0 5% 1/16W
JW6	1-216-864-11	METAL GLAZE 0 5% 1/16W
JW301	1-216-296-00	METAL GLAZE 0 5% 1/8W
JW302	1-216-296-00	METAL GLAZE 0 5% 1/8W
JW801	1-216-295-00	(AEP,IT,WG)...METAL GLAZE 0 5% 1/10W
JW802	1-216-295-00	METAL GLAZE 0 5% 1/10W
JW803	1-216-296-00	METAL GLAZE 0 5% 1/10W
L1	1-402-487-11	ANTENNA, FERRITE-ROD
L3	1-426-509-41	COIL (FM RF)
L4	1-406-392-11	COIL (FM OSC)
L5	1-406-177-61	COIL
L6	1-410-204-31	INDUCTOR CHIP 10UH
L101	1-410-196-11	INDUCTOR CHIP 2.2UH
L201	1-410-196-11	INDUCTOR CHIP 2.2UH
L301	1-410-196-11	INDUCTOR CHIP 2.2UH
L801	1-410-204-31	INDUCTOR CHIP 10UH
L802	1-410-196-11	INDUCTOR CHIP 2.2UH
L803	1-410-204-31	INDUCTOR CHIP 10UH
L804	1-410-196-11	INDUCTOR CHIP 2.2UH
LCD1	1-808-971-11	DISPLAY PANEL, LIQUID CRYSTAL
M901	1-541-648-11	MOTOR, DC

Ref.No.	Part No.	Description
Q1	8-729-101-25	TRANSISTOR 2SC1009A-FA4
Q2	8-729-102-08	TRANSISTOR 2SC2223-F14
Q3	8-729-900-53	TRANSISTOR DTC114EK
Q4	8-729-900-53	TRANSISTOR DTC114EK
Q5	8-729-900-53	TRANSISTOR DTC114EK
Q6	8-729-100-66	TRANSISTOR 2SC1623-L6
Q7	8-729-900-53	(WG,IT,AEP,E,UK)...TRANSISTOR DTC114EK
Q8	8-729-162-44	TRANSISTOR 2SB624-BV4
Q9	8-729-100-66	TRANSISTOR 2SC1623-L6
Q10	8-729-403-17	TRANSISTOR XN1215
Q11	8-729-900-53	TRANSISTOR DTC114EK
Q101	8-729-900-51	TRANSISTOR DTA114TK
Q201	8-729-900-51	TRANSISTOR DTA114TK
Q301	8-729-920-06	TRANSISTOR DTC124TK-T-146
Q302	8-729-162-44	TRANSISTOR 2SB624-BV4
Q303	8-729-900-51	TRANSISTOR DTA114TK
Q304	8-729-900-53	TRANSISTOR DTC114EK
Q305	8-729-100-66	TRANSISTOR 2SC1623-L6
Q801	8-729-900-53	TRANSISTOR DTC114EK
Q802	8-729-900-51	TRANSISTOR DTA114TK
Q803	8-729-117-84	TRANSISTOR 2SK160AK26
Q804	8-729-159-64	TRANSISTOR 2SD596
Q808	8-729-102-08	TRANSISTOR 2SC2223F14
Q811	8-729-900-51	TRANSISTOR DTA114TK
R1	1-216-849-11	METAL GLAZE 220K 5% 1/16W
R3	1-216-833-11	METAL GLAZE 10K 5% 1/16W
R5	1-216-838-11	METAL GLAZE 27K 5% 1/16W
R6	1-216-819-11	METAL GLAZE 680 5% 1/16W
R7	1-216-849-11	METAL GLAZE 220K 5% 1/16W
R8	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W
R9	1-216-853-11	METAL GLAZE 470K 5% 1/16W
R10	1-216-853-11	METAL GLAZE 470K 5% 1/16W
R11	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W
R14	1-216-845-11	METAL GLAZE 100K 5% 1/16W
R16	1-216-843-11	METAL GLAZE 68K 5% 1/16W
R17	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W
R18	1-216-837-11	(WG,IT,E,AEP,UK) ...METAL GLAZE 22K 5% 1/16W
R20	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W
R22	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W
R23	1-216-845-11	METAL GLAZE 100K 5% 1/16W
R24	1-216-845-11	METAL GLAZE 100K 5% 1/16W
R25	1-216-853-11	METAL GLAZE 470K 5% 1/16W
R26	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W
R27	1-216-809-11	METAL GLAZE 100 5% 1/16W

Ref.No.	Part No.	Description
R28	1-216-089-00	METAL GLAZE 47K 5% 1/10W
R30	1-216-833-11	METAL GLAZE 10K 5% 1/16W
R31	1-216-841-11	METAL GLAZE 47K 5% 1/16W
R32	1-216-833-11	METAL GLAZE 10K 5% 1/16W
R33	1-216-839-11	METAL GLAZE 330 1/16W
R101	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R102	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R103	1-216-109-00	METAL GLAZE 330K 5% 1/10W
R104	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R105	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W
R106	1-216-635-11	METAL CHIP 220 0.50% 1/10W
R107	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R108	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W
R109	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W
R110	1-216-112-00	METAL GLAZE 430K 5% 1/10W
R111	1-216-691-11	METAL CHIP 47K 0.50% 1/10W
R112	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W
R113	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W
R114	1-216-673-11	METAL CHIP 8.2K 0.50% 1/10W
R115	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R116	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R117	1-216-198-00	METAL GLAZE 1K 5% 1/8W
R118	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W
R201	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R202	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R203	1-216-109-00	METAL GLAZE 330K 5% 1/10W
R204	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R205	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W
R206	1-216-635-11	METAL CHIP 220 0.50% 1/10W
R207	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R208	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W
R209	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W
R210	1-216-112-00	METAL GLAZE 430K 5% 1/10W
R211	1-216-691-11	METAL CHIP 47K 0.50% 1/10W
R212	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W
R213	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W
R214	1-216-673-11	METAL CHIP 8.2K 0.50% 1/10W
R215	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R216	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R217	1-216-198-00	METAL GLAZE 1K 5% 1/8W
R218	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W
R301	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R302	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R304	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R306	1-216-017-00	METAL GLAZE 47 5% 1/10W

Ref.No.	Part No.	Description			
R309	1-216-838-11	METAL GLAZE	27K	5%	1/16W
R310	1-216-099-11	METAL GLAZE	120K	5%	1/16W
R401	1-216-639-11	METAL CHIP	330	0.50%	1/10W
R402	1-216-627-11	METAL CHIP	100	0.50%	1/10W
R801	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R802	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R804	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R805	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R806	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R807	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R808	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R809	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R810	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R814	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R815	1-216-025-00	METAL GLAZE	100	5%	1/10W
R816	1-216-045-00	METAL GLAZE	680	5%	1/10W
R817	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R818	1-216-025-00	METAL GLAZE	100	5%	1/10W
R821	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R825	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R826	1-216-089-00	(US,Canadian,E,UK) ...METAL GLAZE	47K	5%	1/10W
R827	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R828	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R830	1-216-647-11	METAL CHIP	680	0.50%	1/10W
R831	1-216-675-11	METAL CHIP	10K	0.50%	1/10W
RV301	1-230-593-11	RES, VAR, CARBON 10K/10K (VOL)			
RV601	1-238-237-11	RES, ADJ, CERMET 470 (SPEED)			
S301	1-572-271-11	SWITCH, LEAF			
S302	1-571-859-11	SWITCH, LEAF			
S303	1-572-272-21	SWITCH, SLIDE			
S304	1-571-277-11	SWITCH, SLIDE			
S801	1-572-270-11	SWITCH, KEYBOARD			
S802	1-572-270-11	SWITCH, KEYBOARD			
S803	1-572-270-11	SWITCH, KEYBOARD			
S804	1-572-270-11	SWITCH, KEYBOARD			
S805	1-572-270-11	SWITCH, KEYBOARD			
S806	1-572-270-11	SWITCH, KEYBOARD			
S807	1-572-270-11	SWITCH, KEYBOARD			
S808	1-572-270-11	SWITCH, KEYBOARD			
S809	1-572-270-11	SWITCH, KEYBOARD			
S810	1-572-270-11	SWITCH, KEYBOARD			
S811	1-572-270-11	SWITCH, KEYBOARD			
S812	1-572-270-11	SWITCH, KEYBOARD			
S813	1-572-270-11	SWITCH, KEYBOARD			
S814	1-571-275-11	SWITCH, SLIDE			

Ref.No.	Part No.	Description
SU1	1-466-100-11	SERVO UNIT
T1	1-404-690-11	TRANSFORMER, IF
T801	1-424-351-21	TRANSFORMER, DC-DC CONVERTER
W301	1-529-084-11	BUZZER
X801	1-577-262-11	VIBRATOR, CRYSTAL (75kHz)

ACCESSORY & PACKING MATERIAL

*3-360-028-01	(US,Canadian).....INDIVIDUAL CARTON
*3-360-034-01	(UK,E,AEP,WG,IT)...INDIVIDUAL CARTON
*3-360-029-01	CUSHION (UPPER)
*3-360-030-01	CUSHION (LOWER)
3-751-661-31	(Canadian,E)...INSTRUCTION
3-751-662-11	(AEP,UK,Canadian,E,WG,IT) ...MANUAL, INSTRUCTION (ENGLISH/FRENCH)
3-751-662-21	(US).....MANUAL, INSTRUCTION (ENGLISH)
3-751-662-41	(AEP,WG)...MANUAL, INSTRUCTION (GERMAN/DUTCH)
3-751-662-51	(AEP,E,WG)....MANUAL, INSTRUCTION (SPANISH/PORTUGUESE)
3-751-662-61	(AEP,IT,WG)...MANUAL, INSTRUCTION (SWEDISH/ITALIAN)
8-952-261-90	(EXCEPT E)...HEADPHONE MDR-W15L/Y SET
8-952-265-90	(E).....HEADPHONE MDR-E215/Y SET
X-3347-197-1	CASE ASSY, CARRYING

English
90F1693-1
Printed in Japan
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Published by Customer Relations and Service Group

9-955-957-11

Sony Corporation
Audio Group